

3:00 p.m.

866-5

### Incidence, Predictors, and Effects on Outcome of First Episode of Atrial Fibrillation in Patients Diagnosed With Mitral Valve Prolapse: A Community Study

Jean-Francois Avierinos, Maurice Enriquez Sarano, Mayo Foundation, Rochester, Minnesota.

**Background:** Incidence and predictors of atrial fibrillation (Afib) in the course mitral valve prolapse (MVP) have never been defined in the community and its consequences on outcome have not been analyzed.

**Methods:** In a community sample of 777 Olmsted county patients diagnosed with MVP at Mayo Clinic between 1989 and 1998, in sinus rhythm at diagnosis (mean age=49±20, 66% of females, patients with history of hypertension=11%, mean left ventricular ejection fraction (LVEF)=62±7%, mitral regurgitation greater or equal to moderate=16%), we defined long-term rates of first episode of Afib. We analyzed its predictors and its interaction with subsequent occurrence of first ischemic neurologic events (INE). **Results:** During mean FU of 5.5±3.0 years, 63 patients experienced at least one episode of Afib. Five- and 10-year rates of Afib were 7±1 and 13±2 percent, respectively. Comparison with reported rates in the general population of similar age showed almost twofold increase in incidence of Afib in MVP patient. By multivariate analysis, variables independently predictive of Afib (hazards ratio, 95% CI) were: age (1.05 [1.04-1.08], p<0.001), mitral regurgitation (MR) greater or equal to moderate (8.1[2.4-28.0], p<0.001), slight MR (3.7[1.1-12.6], p=0.03), left atrium diameter (1.9[1.1-3.2], p=0.01) and lower LVEF (1.03[1.01-1.05], p=0.04). During FU, 5- and 10-year rates of INE were 3±0.7 and 7±1 percent respectively. By multivariate analysis, independent predictors of INE were: Afib (4.3[1.9-10.0], p<0.001) and cardiac surgery performed during FU (2.5[1.1-5.8], p=0.03), tested as 2 time dependent variables, as well as age (1.08 [1.04-1.11], p<0.001) and mitral valve thickening (3.2[1.4-7.4], p=0.008). **Conclusion:** In this large community-based study, 1) patients with MVP display high rates of Afib 2) Afib during FU is the major determinant of occurrence of INE 3) MR at diagnosis is a strong predictor of Afib and appears as an indirect risk factor for INE, through Afib and need for cardiac surgery.

3:15 p.m.

866-6

### Percutaneous Catheter-Based Mitral Valve Repair

Stephen N. Oesterle, Alan M. Gillinov, Chi-Hui Chin, Yan-Qiu Xing, Aldo D. Prado, Natesa G. Pandian, Massachusetts General Hospital, Boston, Massachusetts, Tufts-New England Medical Center, Boston, Massachusetts.

#### Background:

Mitral regurgitation (MR) is common in patients with Congestive Heart Failure (CHF) caused by ischemic and dilated cardiomyopathy. The mechanism of MR in these patients is incomplete coaptation of the mitral leaflets due to changes in annular and ventricular geometry. Surgical correction is achieved by mitral annuloplasty, which currently entails substantial risk and requires cardiopulmonary bypass and cardiac arrest. We have evaluated a catheter-based percutaneous transvenous method for mitral repair that uses the coronary sinus (CS) as a delivery pathway.

#### Methods:

Ischemic MR was created by temporary occlusion of the circumflex coronary artery in 6 healthy, anesthetized 35-45 kg sheep. A 7F sheath was placed percutaneously in the jugular vein and advanced into the CS. A composite stainless steel/nitinol annuloplasty device was then coaxially passed through the sheath and positioned in the CS during ischemic MR under echocardiographic and fluoroscopic guidance. The impact on the severity of MR was assessed by echocardiography.

#### Results:

Baseline MR was 0-1+. Circumflex occlusions produced 3-4+ MR and this was reduced to 0-1+ MR in all animals by positioning the annuloplasty device in the CS. The annuloplasty device caused conformational changes in the mitral annulus that improved leaflet coaptation. Systolic mitral annular diameter decreased from 30 ± 2.1 to 24 ± 1.7 mm (p<0.001); MR jet area decreased from 6.54 ± 2.2 to 0.4 ± 0.5 cm<sup>2</sup> (p<0.001). Continuous wave Doppler confirmed that the annuloplasty device did not produce mitral stenosis. MR returned to 3-4+ upon retraction of the device. Delivery of the annuloplasty device is straight forward. It can be deployed in less than one minute following placement of the CS sheath.

#### Conclusion:

Percutaneous mitral repair to treat MR caused by ischemic left ventricular dysfunction is feasible and easily accomplished. Transvenous catheter-based mitral annuloplasty offers a promising and minimally invasive therapeutic approach for patients with heart failure and MR caused by left ventricular dysfunction.

## POSTER SESSION

### 1203 Management Issues After Cardiac Surgery

Tuesday, March 19, 2002, 3:00 p.m.-5:00 p.m.

Georgia World Congress Center, Hall G

Presentation Hour: 4:00 p.m.-5:00 p.m.

1203-131

### Energy Dose for Intra-Operative Biphasic-Shock Direct Defibrillation

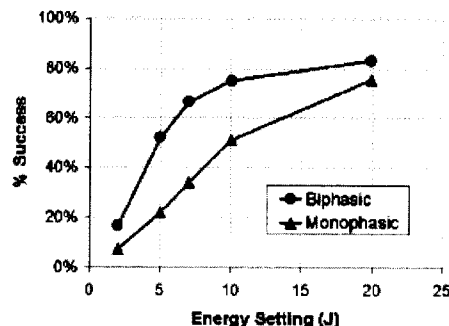
Birgit Schwarz, Andrew Bowdle, Kimble Jett, Peter Mair, Karl H. Lindner, Gabrael S. Aldea, Robert Lazzara, Sharon G. O'Grady, Paul W. Schmitt, Robert G. Walker, Willis A. Tacker, University of Innsbruck, Innsbruck, Austria, University of Washington School of Medicine, Seattle, Washington.

**Background:** Biphasic (B) shocks are becoming standard in external defibrillators, but no clinical data have been reported comparing them to conventional monophasic (M) shocks for defibrillation (D) via internal paddles. This randomized, controlled trial compared B to M (damped sine) shocks and provided clinical dosage information.

**Methods:** Ninety-one patients undergoing cardioplegic bypass surgery were randomized to get either BD or MD after aortic clamp removal. Step-up shocks were given (2.5, 7, 10 and 20 Joules (J)) using 2-inch dia. paddles until D occurred. Patients not D with a 20J shock were D by either a 20J shock of the other waveform, or by a >20J shock (except for one patient that required larger paddles). Cumulative success curves for the two waveforms were tested for statistical difference.

**Results:** Curves for BD and MD in the figure show higher success rates for BD at all energies between 2 and 20J (p=0.027). Compared to the M group, the B group required, on average, fewer shocks (2.5 vs 3.5; p=0.002), less threshold energy (6.8 J vs 11.0 J; p=0.003) and less cumulative energy (12.6 J vs 23.4 J; p=0.002).

**Conclusions:** This study demonstrates the superiority of these B shocks over M shocks, and guides selection of first shock B energy dosage. For 2" paddles, a first shock of 5 J favors lower initial, cumulative and average threshold energies. A first shock of 10 to 20 J favors more rapid D and fewer shocks. Or, customary success rates may be maintained by selecting a B energy of 1/2 that now used for M shocks.



1203-132

### A Short-Term Analysis of Permanent Pacemaker Implantation and Utilization After Cardiac Surgery

Jo-ann E. Lynch, James B. Kirchhoffer, James R. Cook, Cynthia B. Kardos, Barry J. Karas, Laura L. Liucci, John A. Rousou, Joseph E. Flack, III, David W. Deaton, Daniel T. Engelman, Richard M. Engelman, Baystate Medical Center, Springfield, Massachusetts.

**Background:** Arrhythmias occur in 40-60% of patients after cardiac surgery, but most resolve spontaneously. Permanent pacemakers (PPM) may be implanted postoperatively for symptomatic sinus node dysfunction (SND) or AV block (AVB). Previous studies have yielded conflicting data on the continued utilization of pacing therapy after heart surgery.

**Methods:** We evaluated patients undergoing cardiac surgery at one institution from 8/1992 to 12/2000. Baseline clinical data, type of operation (CABG +/- valve), cardioplegia, and reason for PPM (SND vs. AVB) were recorded. Patients were followed at 4-6 weeks after implant and pacer activity evaluated from device memory. Data are presented as mean ± SD or proportions and linear regression was used to identify factors associated with increased PPM use.

**Results:** Over the study period, 6251 patients underwent cardiac surgery of which 107 patients (1.7%) were identified who suffered postoperative arrhythmias resulting in PPM. In the PPM patients, coronary artery bypass grafting was performed in 65%, and valve surgery in 52%. Warm cardioplegia was used for 87% of all operations. SND was the primary indication for 63% of PPM implants. The average time to implant was 6 days postoperatively.

Compared to the surgical population overall, the pacemaker cohort was older (69±12.3 vs 66±11.3 years, p<0.01), and more likely to have valve surgery (52% vs. 23%, p<0.001), but were similar with respect to gender, preoperative diabetes mellitus, hypertension and renal failure. PPM implantation for AV block was more likely associated with valve surgery (OR=4, p<0.01).

At follow-up, with data available on 46 patients, the average time spent atrial and ventricular pacing was 52% and 62%, respectively (p=NS, SND vs AVB). No other clinical or operative variables were associated with more frequent PPM use at the follow-up visit.

**Conclusions:** Patients who undergo PPM after cardiac surgery, according to current guidelines, employ the pacer frequently. Interestingly, patients with SND exercise both atrial and ventricular pacing as frequently as those with an AVB indication. No preoperative variables or medications improved the prediction for postoperative pacemaker utilization.